ALDISA SANGUINEA COOPERI SUBSPEC. NOV. FROM THE COAST OF THE STATE OF WASHINGTON, WITH NOTES ON ITS FEEDING AND SPAWNING HABITS (NUDIBRANCHIA : DORIDIDAE : ALDISINAE)

AUTHOR(S):

Robilliard, Gordon A.; Baba, Kikutaro

CITATION:

Robilliard, Gordon A. ...[et al]. ALDISA SANGUINEA COOPERI SUBSPEC. NOV. FROM THE COAST OF THE STATE OF WASHINGTON, WITH NOTES ON ITS FEEDING AND SPAWNING HABITS (NUDIBRANCHIA : DORIDIDAE : ALDISINAE). PUBLICATIONS OF THE SETO MARINE BIOLOGICAL LABORATORY 1972, 19(6): 409-414

ISSUE DATE:

1972-03-31

URL:

http://hdl.handle.net/2433/175737

ALDISA SANGUINEA COOPERI SUBSPEC. NOV. FROM THE COAST OF THE STATE OF WASHINGTON, WITH NOTES ON ITS FEEDING AND SPAWNING HABITS (NUDIBRANCHIA: DORIDIDAE: ALDISINAE)

GORDON A. ROBILLIARD[1] and KIKUTARÔ BABA[2]

With 4 Text-figures

The dorid nudibranch, first collected from the coast of the state of Washington and observed by the first author, was identified by the second author with *Aldisa sanguinea* (COOPER, 1862), the species common on California coasts, but at the same time separated from this as a subspecies for differences mainly in pattern of black spots. Then, the Japanese specimens which were collected from the north to south of the country and identified in 1940 by the second author as *Aldisa sanguinea* should be placed under the present new subspecies. In this paper, the second author is responsible for taxonomic descriptions and discussions, while the first author is so for biological notes; of course, however, the new subspecies is proposed here on the agreement of both authors.

Aldisa sanguinea cooperi subspec. nov.

Type specimen: body-length 25 mm.

Paratype specimens: body-length 20–25 mm.

Type locality: Umatilla Reef, Washington, U.S.A. (long. 124°47′ W; lat. 48°10′ 45″N).

Date of collection: September 8, 1969 (total of 7 specimens).

Geographic distribution: Umatilla Reef, Washington; Anguilar Point, Barkley Sound, British Columbia.

The specimens were identified on the specific level with *Aldisa sanguinea* (COOPER, 1862) for the following internal diagnostic characters: 1) the spatular form and denticulated upper margin of the radular teeth, and 2) the cylindrical penis armed on the length with recurved chitinous hooks. However, they are distinguished from the type

1) Department of Zoology and Friday Harbor Laboratories, University of Washington, Seattle, Washington, U.S.A. 98105; now moved to: Woodward-Envicon, Inc., 3489 Kurtz Street, San Diego, California, U.S.A. 92110.

2) Shigigaoka 35, Minami-11-jo, Sango-cho, Ikoma-gun, Nara-ken, Japan 636.

Publ. Seto Mar. Biol. Lab., XIX (6), 409–414, 1972. (Article 26)

form of the species by the following differences and defined as the subspecies *cooperi* nov. in memory of Mr. COOPER for his work on *Aldisa* and other opisthobranchs of the Pacific coast of North America. For descriptions of the type form, see MCFARLAND, 1905, 1906, 1966; O'DONOGHUE, 1927; ROLLER, 1969.

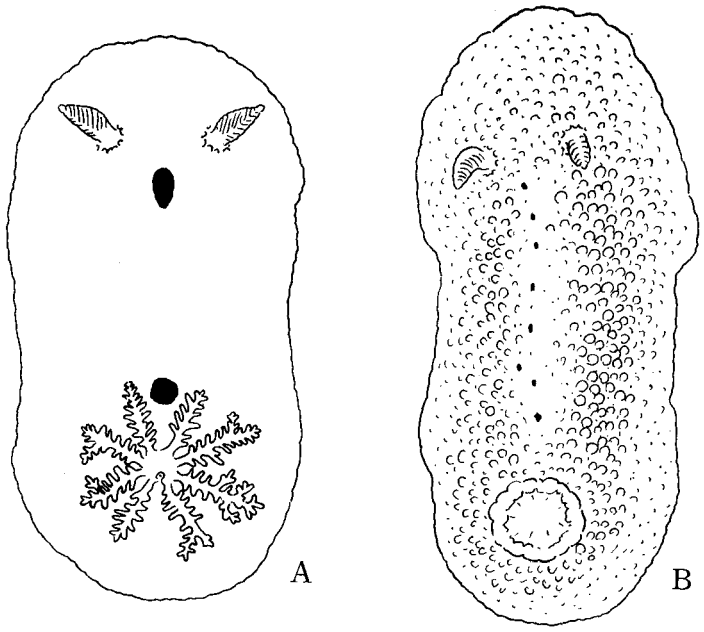

Fig. 1. *Aldisa sanguinea* (COOPER, 1862). Size and arrangement of mid-dorsal black spots. A. Type form from Monterey Bay, California (after MACFARLAND, 1906 and 1966, but the dorsal granulations are omitted), with two large, black spots on the reddish background. Length of animal 17 mm. B. *A. sanguinea cooperi* subspec. nov. from Umatilla Reef, Washington (a living paratype drawn from a color photo), with a series of 8 small, black spots on the lemon yellow background. Length of animal 25 mm.

Aldisa sanguinea (COOPER, 1862)

1. Body light to dark red and densely dotted with minute black points.
2. Usually 2 large, round or oval, black spots are located mid-dorsally between the rhinophores and branchiae, the anterior one may be divided into two. In addition, there may be a chrome yellow "T"-shaped mark on the posterior half of the dorsum.

Aldisa sanguinea cooperi subspec. nov.

1. Body lemon yellow to cadmium orange and dotted with minute black points usually less densely than in the type form.
2. Black spots in the mid-dorsal line are smaller and then less prominent than in the type form, varying in number from 6 to 11, but mostly 8 or 9 in examined specimens.

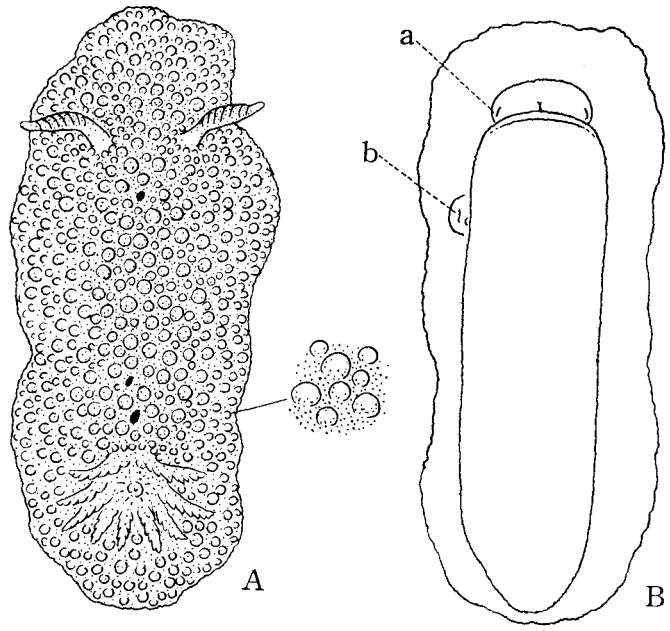

Fig. 2. *Aldisa sanguinea cooperi* subspec. nov. A-B. Dorsal and ventral sides of a specimen collected from Sugashima, Shima, on April 18, 1954, length 25 mm, with 3 black spots on the back. a. oral tentacle, b. genital orifices.

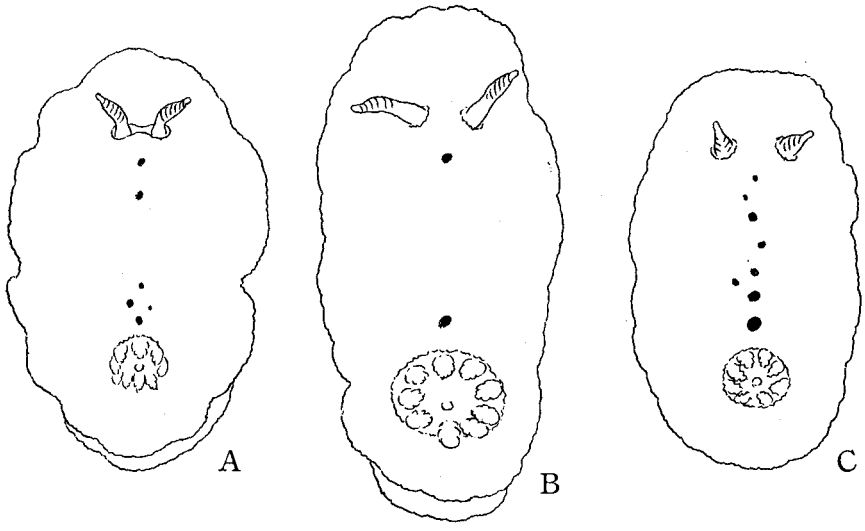

Fig. 3. *Aldisa sanguinea cooperi* subspec. nov. A-C. Three specimens with different numbers of black spots (specimen A: Sugashima, April 8, 1951, length 20 mm, rhinophore sheaths united; specimen B: Sugashima, May 7, 1951, length 25 mm; specimen C: Shirikishinai, Hokkaido, August 30, 1954, length 25 mm).

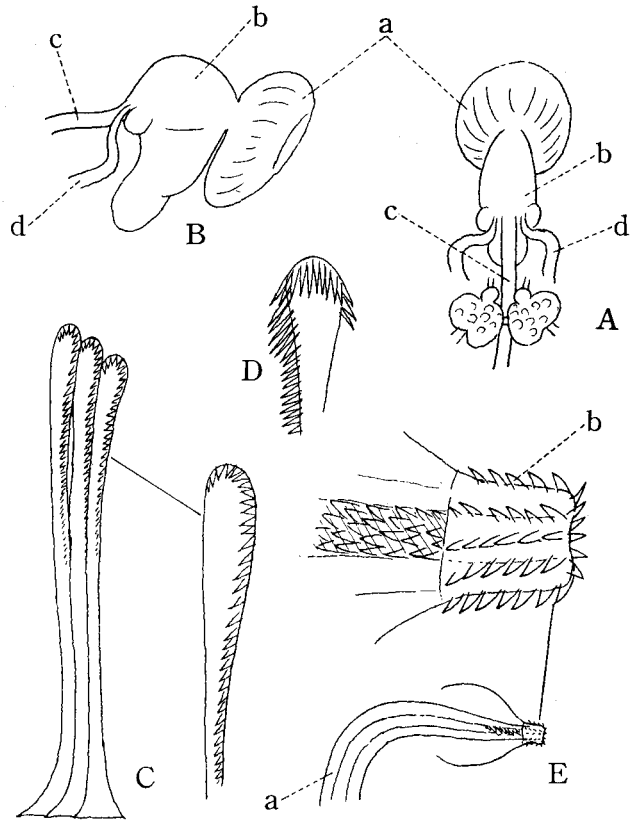

Fig. 4. *Aldisa sanguinea cooperi* subspec. nov. Anatomy of a specimen collected from Sugashima on April 18, 1954, length 17 mm. A-B. Pharyngeal region from above and side, a. oral tube, b. pharynx, c. oesophagus, d. salivary gland; C-D. Different aspects of the lateral teeth (C, ×130; D, ×330); E. Distal part of the armed penis, a. vas deferens, b. hooks.

Taxonomic remarks: A form reported from Santa Barbara Island by COOPER (1863, p. 58) as *Doris sanguinea* seems to be attributable to the present new subspecies. The Japanese specimens identified in 1940 by the second author as *A. sanguinea* (Japanese name: Chishio-umiushi) should, according to the opinion of the second author, be attributed to the present new subspecies. They were described as *Aldisa sanguinea* in:

BABA, 1940, pp. 103–104, text-figs. 1–2.–Asamushi, Mutsu Bay; BABA, 1949, pp. 62–63, 150, pl. 24, fig. 86, text-fig. 75.–Sagami Bay; BABA, 1957, p. 9 (list); BABA, HAMATANI & HISAI, 1956, p. 211, pl. 24, fig. 6 (spawn).

Their geographic distribution is ranging from Hokkaido to Kyushu Island of Japan: Shirikishinai, Hokkaido; Asamushi, Mutsu Bay; Tateyama Bay, Boshu; Sagami Bay; Sugashima, Shima; Osaka Bay; Tomioka, Amakusa.

The living animals are about 20–25 mm long. The granulated back, the bipinnate branchiae set in a circle, the auriform oral tentacles, the radula consisting of

numerous spatulate teeth and the armed penis are the characters placing the specimens under *A. sanguinea*. The general ground-color of the body is nearly the same as in the type form of *A. sanguinea,* and vivid orange yellow as described so previously by the second author in 1940, but never become paler to lemon yellow. Minute black points are sprinkled over the back as in the type form. There are usually 2–3 small black spots, instead of larger ones, in the median dorsal line between the rhinophores and branchiae, sometimes these may be decreased to 1 or increased to 8. The existence of such smaller black spots in the dorso-median line seems to be a decisive feature for the identification of the Japanese specimens with the present new subspecies. Variation of number of these black spots or of tint of the general body-color is regarded here as of an intrasubspecific nature.

Biological notes: Seven specimens of the present subspecies were collected on September 8, 1969 on a rocky wall at Umatilla Reef, Washington, 25 m deep. Most of them were found feeding on some orange-red sponges of Demospongiae. A couple of this subspecies in copulation and another animal laying an egg ribbon were found on another mass of the same sponge. Both the nudibranch and its eggs were colored almost the same as the sponge.

Four other animals were found on June 26, 1970 on the bottom of a boulder at Anguilar Point, Barkley Sound, 10 m deep. All these were found feeding on an orange sponge, too, although it was not known whether the sponge belonged to the same species observed at Umatilla Reef. This time, no sexual behavior was observed.

Egg ribbons were laid on either the sponge or the rock surface, in a tight but increasing spiral of 4 to 5 turns; about 15 mm in diameter and 3 to 4 mm in height of ribbon.

Summary

1. *Aldisa sanguinea cooperi* subspec. nov. from the coast of Washington State is separated from the type form of *A. sanguinea* (Cooper, 1862) from California.

2. The Japanese specimens identified in 1940 by Baba as *Aldisa sanguinea* should be treated under this new subspecies, because of the smaller size of the black spots in the median dorsal line.

3. This subspecies seems to feed on an orange-red demosponge on which eggs may be laid.

REFERENCES

Baba, Kikutarô

1940. Some additions to the nudibranch fauna of the northern part of Japan. Bull. Biogeogr. Soc. Japan, vol. 10, no. 6, pp. 103–111, text-figs. 1–10.

1949. Opisthobranchia of Sagami Bay, collected by his Majesty the Emperor of Japan. 4+2+194 +7 pp., pls. 1–50 (in color), 161 text-figs. Iwanami Shoten, Tokyo.

1957. A revised list of the species of Opisthobranchia from the northern part of Japan, with some

additional descriptions. Journ. Fac. Sci. Hokkaido Univ., ser. 6, Zool., vol. 13, nos. 1–4, pp. 8–14, figs. 1–6.

BABA, Kikutarô, Iwao HAMATANI & Keijiro HISAI

1956. Observations on the spawning habits of some of the Japanese Opisthobranchia (II). Publ. Seto Mar. Biol. Lab., vol. 5, no. 2, pp. 209–220, pls. 24–26.

COOPER, James Graham

1862. Some genera and species of California Mollusca. Proc. Calif. Acad. Nat. Sci., vol. 2, pp. 202–207.

1863. On new or rare Mollusca inhabiting the coast of California. No. II. Proc. Calif. Acad. Nat. Sci., vol. 3, pp. 56–60, fig. 14.

MACFARLAND, Frank Mace

1905. A preliminary account of the Doridiidae of Monterey Bay, California. Proc. Biol. Soc. Washington, vol. 18, pp. 35–54.

1906. Opisthobranchiate Mollusca from Monterey Bay, California, and vicinity. Bull. Bureau Fish. for 1905, vol. 25, pp. 109–151, pls. 18–31.

1966. Studies of opisthobranchiate mollusks of the Pacific coast of North America. Mem. Calif. Acad. Sci., vol. 6, xvi+546 pp.; 72 pls.

MARCUS, Ernst

1961. Opisthobranch mollusks from California. The Veliger, vol. 3 (Supplement, pt. I), pp. 1–85, pls. 1–10.

O'DONOGHUE, Charles Henry

1926. A list of the nudibranchiate Mollusca recorded from the Pacific coast of North America, with notes on their distribution. Trans. Roy. Canad. Inst., vol. 15, no. 2, pp. 199–247.

1927. Notes on a collection of nudibranchs from Laguna Beach, California. Journ. Entom. Zool. Pomona College, vol. 19, nos. 1–4, pp. 77–119, pls. 1–3.

ROLLER, Richard A.

1969. A color variation of *Aldisa sanguinea*. The Veliger, vol. 11, no. 3, pp. 280–281, text fig. 1.